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IS 3491 (1965): Safflower oil [FAD 13: Oils and Oilseeds]



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IS : 3491 - 1965
(Reaffirmed 1981)

Indian Standard
SPECIFICATION FOR
SAFFLOWER OIL

REAFFIRMED

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(Incorporating Amendment No. 1)

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Indian Standard

SPECIFICATION FOR SAFFLOWER OIL

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AMENDMENT NO. 2 AUGUST 1982
TO
IS : 3491 - 1965 SPECIFICATION FOR
SAFFLOWER OIL

[Iodine value of safflower oil has been found to be more than maximum specified limit in the recent past. Samples of safflower seeds were collected from major producing centres and tested in different independent laboratories. The test results confirmed the higher value and on the basis of these results the concerned technical committee decided to raise the limit for iodine value up to 148 in this specification.]

Alterations

(*First cover, pages 1 and 3, title*) — Substitute the following for the existing title:

‘ Indian Standard

**SPECIFICATION FOR SAFFLOWER
SEED OIL ‘**

(*Page 3, clause 1.1, line 2*) — Substitute ‘ safflower seed oil ’ for ‘ safflower oil ’.

[*Page 4, clauses 2.1.1 and 2.1.2 (see also Amendment No. 1)*] — Substitute ‘ safflower seed oil ’ for ‘ safflower oil ’, wherever it appears in the clauses.

[*Page 5, Table 1 (see also Amendment No. 1)*]:

- a) *Caption* — Substitute ‘ **SAFFLOWER SEED OIL** ’ for ‘ **SAFFLOWER OIL** ’.
- b) *Col 3 to 7, against Sl No. (vi)* — Substitute ‘ 138 to 148 ’ for ‘ 138 to 146 ’.

AMENDMENT NO. 3 MARCH 1989
TO
IS : 3491 - 1965 SPECIFICATION FOR
SAFFLOWER SEED OIL

(*Page 4, clause 2.1.1*) — Substitute the following for the existing clause:

'2.1.1 Refined Safflower Seed Oil — Refined safflower seed oil means oil which is obtained by expression or solvent extraction of safflower seed oil bearing materials, deacidified either with alkali or physical refining or by miscella refining by bleaching with adsorbent earth and/or carbon and deodorized with steam.'

(*Page 4 clause 4.2*) — Substitute the following for the existing clause:

'4.2 Admixture with Other Oils — The material shall be free from admixture of other oils.

4.2.1 The material shall be free from non-edible oils when tested according to 9, 10, 11, 12, 14, 15 and 16 of IS : 548 (Part 2)-1976*.

(*Page 6, clause 6.2*) — Add the following new clause after 6.2:

'6.2.1 The containers may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

*Methods of sampling and test for oils and fats: Part 2 Purity test.

(CAFDC 5)

**AMENDMENT NO. 4 SEPTEMBER 1995
TO
IS 3491 : 1965 SPECIFICATION FOR SAFFLOWER
SEED OIL**

(*Page 3, Foreword*) — Add the following clause 0.4 after clause 0.3 and renumber the subsequent clause:

'0.4 A scheme for labelling environment friendly products to be known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF). The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No. 71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR 85(E) dated 21 February 1991. For a product to be eligible for marking with the ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environment friendly (EF) requirements. The EF requirements for Safflower Seed oil are therefore being included through an amendment.

This amendment is based on the Gazette Notification No. 678 dated 30 August 1994 for Labelling Edible Oils, Tea and Coffee as environment friendly products, published by the Ministry of Environment and Forests.'

(*Page 5, Table 1*) — Add the following clauses after Table 1:

'4.4 Optional Requirements for ECO Mark

4.4.1 General Requirements

4.4.1.1 The product shall conform to the requirements of quality prescribed under clauses 4.1 to 4.3.

4.4.1.2 The manufacturers shall produce to BIS environmental consent clearance from the concerned State Pollution Control Board as per the norms laid down under the Water (*Prevention and Control of Pollution*) Act, 1974; Air (*Prevention and Control of Pollution*) Act, 1981; Water (*Prevention and Control of Pollution*) Cess Act, 1977, respectively, along with the authorization, if required under the Environment (*Protection*) Act, 1986, while applying for ECO Mark.

4.4.2 Specific Requirements

Amend No. 4 to IS 3491 : 1965

4.4.2.1 The product shall not contain aflatoxin, more than 5 mg/kg, when tested by the method prescribed in Appendix A.

4.4.2.2 The pesticide residues, if any, shall not exceed the tolerance limits as prescribed in the *Prevention of Food Adulteration Act, 1954* and Rules made thereunder.

4.4.2.3 Only permitted antioxidants not exceeding the quantities specified against each as prescribed under the *Prevention of Food Adulteration Act, 1954* and Rules made thereunder, shall be used, if required.

4.4.2.4 The product shall not contain any of the toxic metals in excess of the quantities prescribed in Table 2.

TABLE 2 LIMITS FOR TOXIC METALS

SL NO	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO
i)	Lead, mg/kg, <i>Max</i>	5 0	15 of IS 1699 1995*
ii)	Arsenic, mg/kg, <i>Max</i>	0 5	do
iii)	Cadmium, mg/kg, <i>Max</i>	1 0	do
iv)	Mercury (total) mg/kg, <i>Max</i>	0.25	do

* Methods of sampling and test for food colours (*second revision*)

(Page 6, clause 5.1) — Add the following clause 5.1.1 after clause 5.1:

‘5.1.1 For ECO Mark the product shall be packed in such packages which are made from recyclable (that is which can be re-processed to manufacture any useful product) or biodegradable materials.’

(Page 6, clause 6.1) — Add the following clause 6.1.1 after 6.1:

“6.1.1 For ECO Mark, the containers shall be marked with the following information:

- List of identified critical ingredients in descending order of quantity, percent by mass, which shall include ‘made from safflower seed oil’;
- The brief criteria for which the product has been labelled for ECO Mark; and
- Shelf life of the product.”

(Page 6, clause 8.2) — Add the following Appendix A after clause 8.2

'APPENDIX A
(Clause 4.4.2.1)

DETERMINATION OF AFLATOXIN

A-1 REAGENTS

A-1.1 Acetone, 70 Percent — 700 ml acetone in 300 ml distilled water.

A-1.2 Acetone, 20 Percent — 200 ml acetone in 800 ml distilled water.

A-1.3 Lead Acetate, 20 Percent — 200 g neutral acetate in distilled water and 3 ml glacial acetic acid, diluted to one litre.

A-2 PROCEDURE

A-2.1 Dissolve 30 g sample in 100 ml hexane.

A-2.2 Extract with 3 × 50 ml 70 percent acetone.

A-2.3 To the extract add 60 ml distilled water and 20 ml lead acetate.

A-2.4 Boil to reduce volume to 150 ml. Cool to about 20°C.

A-2.5 Filter and wash with 20 percent acetone.

A-2.6 Extract filtrate and washings with 3 × 50 ml chloroform.

A-2.7 Pass chloroform layer through anhydrous sodium sulphate.

A-2.8 Concentrate to 50 ml and spot on TLC plate.

A-3 CALCULATION

$$\text{Aflatoxin, mg/kg} = \frac{V \times s \times 1\,000}{v \times m}$$

where

V = volume of extract in ml,

v = volume of extract giving minimum observable fluorescence in μl ,

m = mass of sample in g, and

s = standard toxin giving minimum observable fluorescence in μg .'

(FAD 44)

**AMENDMENT NO. 5 MARCH 2002
TO
IS 3491 : 1965 SPECIFICATION FOR SAFFLOWER OIL**

(Amendment No. 4, page 2, clause 4.4.2.1) — Substitute '5 µg/kg' for '5 mg/kg'.

(FAD 44)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR SAFFLOWER OIL

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 19 November 1965, after the draft finalized by the Oils and Oil-seeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 Safflower is grown almost all over the country. The main areas of production are Maharashtra and Andhra Pradesh. Safflower is indigenously known as *KARDI* (करडी), *KUSUMBHA* (कुसुम्भ) or *BARREY* (बरै). The oil is mostly used for edible purposes.

0.3 Taking into consideration the views of the producers, consumers and technologists, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the uses of the material and the trade and technological practices followed in the field in this country. Substantial assistance in this respect has been derived from the valuable data obtained from the Directorate of Marketing and Inspection, Ministry of Food and Agriculture, Government of India, and from the following publications:

CHAVAN (V M), Niger and safflower. 1961. Indian Central Oil-seeds Committee, Hyderabad.

Symposium on vegetable oils and their products. 1958. National Institute of Sciences of India, New Delhi. Bull. No. 15, March 1960.

Wealth of India : Raw materials. V 2; 1950. Council of Scientific and Industrial Research, New Delhi.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for safflower oil.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given under 2 of IS : 548-1964*, and also those given below shall apply.

2.1.1 Refined Safflower Oil — Safflower oil obtained by the process of expression or solvent-extraction which has been refined by neutralization with alkali, bleached with bleaching earth or active carbon or both, and deodorized with steam, no other chemical agents being used.

2.1.2 Semi-refined Safflower Oil — Safflower oil obtained by the process of solvent extraction which has been neutralized with alkali.

3. TYPES AND GRADES

3.1 The material shall be of the following types and grades:

- a) *Expressed*:
Grade 1 (Raw), and
Grade 2 (Raw).
- b) *Solvent-Extracted*:
Refined Grade,
Semi-refined Grade, and
Grade 1 (Raw).

3.1.1 The semi-refined grade and the grade 1 (raw) of the solvent-extracted type are suitable for making *VANASPATI* and refined oil, and are not for direct edible consumption.

4. REQUIREMENTS

4.1 The material shall be obtained from clean and sound seeds of safflower plant, *Carthamus tinctorius* Linn. fam., Compositae, by a process of expression or by a process of solvent-extraction. It shall be clear and free from rancidity, adulterants, sediment, suspended and other foreign matter, separated water and added colouring and flavouring substances.

4.1.1 The clarity of the material shall be judged by the absence of turbidity after keeping the filtered sample at 30°C for 24 hours.

4.1.2 Solvent-extracted oil shall be obtained from the oleaginous material using solvent hexane conforming to IS : 3470-1966†.

4.2 Admixture with Other Oils — The material shall be free from admixture with other oils, when tested according to the methods prescribed under 20 of IS : 548-1964*.

*Methods of sampling and test for oils and fats (revised).

†Specification for hexane, food grade.

4.3 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR SAFFLOWER OIL

(Clauses 4.3 and 8.1)

Sl. No.	CHARACTERISTIC	REQUIREMENT FOR TYPE					METHOD OF TEST, REF TO CL No.
		Expressed		Solvent-Extracted			
		Grade 1	Grade 2	Refined	Semi-refined	Grade 1 (Raw)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Moisture and insoluble impurities, percent by weight, <i>Max</i>	0.25	0.25	0.10	0.25	0.50	5 and 6 of IS : 548-1964*
ii)	Colour in a $\frac{1}{2}$ -in cell on the Lovibond scale, expressed as <i>T</i> + 5 <i>R</i> , not deeper than:						
	a) original oil	15	15	2.5	4	25	13 of IS : 548-1964*
	b) bleached oil	—	—	—	2.5	5	A-1 of IS : 543-1968†
iii)	Refractive index at 40°C	←————— 1.467 5 to 1.469 0 —————→					10 of IS : 548-1964*
iv)	Specific gravity at 30°/30°C	←————— 0.915 to 0.920 —————→					11 of IS : 548-1964*
v)	Saponification value	←————— 189 to 195 —————→					15 of IS : 548-1964*
vi)	Iodine value (Wijs)	←————— 138 to 146 —————→					14 of IS : 548-1964*
vii)	Acid value, <i>Max</i>	2.0	6.0	0.5	1.0	6.0	7 of IS : 548-1964*
viii)	Unsaponifiable matter, percent by weight, <i>Max</i>	1.0	1.0	1.0	1.0	1.5	8 of IS : 548-1964*
ix)	Flash point, Pensky-Martens (closed), °C, <i>Min</i>	—	—	250	125	100	P : 21 of IS : 1448‡

*Methods of sampling and test for oils and fats (revised).

†Specification for cottonseed oil (second revision).

‡Methods of test for petroleum and its products: Flash point (closed) by Pensky-Martens apparatus. (Since revised).

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5. PACKING

5.1 The material shall be supplied in suitable well-closed containers as agreed to between the purchaser and the supplier.

6. MARKING

6.1 The containers shall be marked with the name and weight of the material in the container; manufacturer's name and trade-mark, if any; batch number; and the month and year of manufacture.

6.2 In addition, in the case of types and grades which are not suitable for direct edible use [namely, the semi-refined grade and grade 1 (raw) of the solvent-extracted type], the following information shall be suitably marked, either printed on the label affixed to the container or lithographed or stencilled thereon with indelible ink in a type size not less than 50 mm:

‘ NOT FOR DIRECT EDIBLE CONSUMPTION ’.

7. SAMPLING

7.1 Representative samples of the material shall be drawn as prescribed under 3 of IS : 548-1964*.

8. TESTS

8.1 Tests shall be carried out as prescribed in 4.1.1 and IS : 548-1964*. References to the relevant clauses of IS : 548-1964* are given in 4.2 and col 8 of Table 1.

8.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1960†) shall be used in tests.

NOTE — ‘ Pure chemicals ’ shall mean chemicals that do not contain impurities which affect the results of analysis.

*Methods of sampling and test for oils and fats (*revised*).

†Specification for water, distilled quality (*revised*).

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